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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/827,985	04/06/2001	Ronald O' Connell	PD7323US	5185

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EXAMINER

CANTELMO, GREGG

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 04/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/827,985

Applicant(s)

CONNELL, RONALD O'

Examiner

Gregg Cantelmo

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply.

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 1-7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 8-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☒ Interview Summary (PTO-413) Paper No(s). 4.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 & 3. 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C.

121:

- I. Claims 1-7, drawn to a method of joining current collector tabs, classified in class 29, subclass 623.4.
- II. Claims 8-18, drawn to a Li-ion battery, classified in class 429, subclass 161.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made.

The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product can be made by a materially different process such as one wherein the tabs are secured via a means other than welding. As well the process can be used to form non-U shaped tab arrangements.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

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4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.
5. Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.
6. During a telephone conversation with Mr. Mark Kusner on March 25, 2003 a provisional election was made without traverse to prosecute the invention of Group II, claims 8-18. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-7 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Information Disclosure Statement

7. The information disclosure statements filed June 18, 2001 and July 16, 2001 have been placed in the application file and the information referred to therein has been considered as to the merits.
8. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered. See

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page 7, lines 1-4 wherein plural U.S. patents are cited none of which are provide on an IDS form.

Drawings

9. The informal drawings received April 6, 2001 are acceptable for examination purposes.

Specification

10. The disclosure is objected to because of the following informalities: the U.S. patent Application listed in paragraphs [0038] and [0048] should be updated since it has issued to a U.S. patent. Appropriate correction is required.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 8-18 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application Publication No. 2002/0081491 (Gross).

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Gross discloses a lithium ion battery comprised of: a plurality of generally planar cell sections each cell section having at least one flat metallic current collector tab (22 and 26) extending therefrom, said cell sections being stacked one on another to form a cell body having a planar upper surface and a planar lower surface; a plurality of said current collector tabs being aligned in spaced apart relationship between said upper planar surface and said lower planar surface and extending from one side of the cell body, each of said tabs having respective free ends 28 and 30 and respective intermediate portions 22 and 26, the free ends 28 are connected to each other and the free ends 30 are connected to each other but the intermediate portions 22 and 26 of the tabs are unattached to each other when said tabs are stacked together at a location offset from the cell body, such that the tabs are folded into a generally U-shaped configuration with said unattached intermediate portions forming a smooth layered generally U shaped structure with said tab ends disposed adjacent said one side of the cell body (Figs 6-8 as applied to claim 8).

Leads 32 and 34 are attached to the respective tab ends 28 and 30 (Figs. 6 and 7 as applied to claim 9).

The leads 32 and 34 are thin metal strips welded to the tab weldment (Figs. 6 and 7 and paragraph [0020] as applied to claim 10).

A portion of the metallic strips 32 and 34 are disposed between the tab weldments on respective ends 28 and 30 and an end of the cell (Figs. 6 and 7 and applied to claim 11).

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A portion of the metallic strips 32 and 34 are bent around and thus are wrapped around the tab weldment (Figs. 6 and 7 as applied to claim 12).

The collector tabs are comprised of metallic mesh and the lead strips are of a solid metal having a width approximately equal to the width of the tabs (Fig. 8 and paragraph [0020] as applied to claim 13).

Gross discloses a lithium ion battery comprised of: a plurality of generally planar cell sections, each cell section having at least one flat metallic current collector tab extending therefrom, said cell sections being stacked one on another to form a cell body, a plurality of said cathode current collector tabs 26 being aligned and extending from one side of the cell body, each of the current collector tabs 26 having an intermediate end 26 and a free end 30 (Fig. 7) a plurality of said anode current collector tabs 22 being aligned and extending from one side of the cell body, each of the current collector tabs 22 having an intermediate end 22 and a free end 28 (Fig. 6), a cathode tab weldment (interface between cathode tab ends 30 and leads 34) joining the free ends 30 of the cathode current collector tabs 26 but leaving the intermediate ends 26 of the current collector tabs unattached to each other (Fig. 7), said cathode current collector tabs 26 are welded together at a location offset from the cell body, such that the cathode current collector tabs are folded into a generally U-shaped configuration with said unattached intermediate portions forming a smooth layered generally U shaped structure with said cathode tab ends disposed adjacent said one side of the cell body, an anode tab weldment (interface between anode tab ends 28 and leads 34) joining the free ends 28 of the anode

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current collector tabs 22 but leaving the intermediate ends 22 of the current collector tabs unattached to each other (Fig. 6), said anode current collector tabs 22 are welded together at a location offset from the cell body, such that the anode current collector tabs are folded into a generally U-shaped configuration with said unattached intermediate portions forming a smooth layered generally U shaped structure with said anode tab ends disposed adjacent said one side of the cell body (Fig. 6 as applied to claim 14).

A strip of metal 34 is attached to the cathode tab weldment to form a cathode battery lead (Fig. 7 and paragraph [0020] as applied to claim 15).

A strip of metal 32 is attached to the anode tab weldment to form a anode battery lead (Fig. 6 and paragraph [0020] as applied to claim 16).

The cathode current collectors tabs and anode current collector tabs are formed of a metal mesh selected from the group consisting of copper and aluminum and the metal strips are selected from the group consisting of copper, aluminum and nickel (paragraph [0020] as applied to claim 17).

A portion of the metallic strips 32 and 34 are disposed between the tab weldments on respective ends 28 and 30 and an end of the cell (Figs. 6 and 7 and applied to claim 18).

13. Claims 8, 9 and 14 are rejected under 35 U.S.C. 102(a) as being anticipated by JP 2000-311665-A (JP '665).

JP '665 discloses a lithium ion battery comprised of: a plurality of generally planar cell sections (Fig. 4), each cell section having at least one flat metallic current collector tab (5a, and 5b) extending therefrom, said cell sections

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being stacked one on another to form a cell body having a planar upper surface and a planar lower surface; a plurality of said current collector tabs 5a and 5b being aligned in spaced apart relationship between said upper planar surface and said lower planar surface (Figs. 2-4) and extending from one side of the cell body, each of said tabs having a free end and an intermediate portion, the free ends of the tabs are connected but the intermediate portions of the tabs are unattached to each other when said tabs are stacked together at a location offset from the cell body (Fig. 10), such that the tabs are folded into a generally U-shaped configuration with said unattached intermediate portions forming a smooth layered generally U shaped structure with said tab ends disposed adjacent said one side of the cell body (Fig. 5b as applied to claim 8).'

Leads 11 are attached to the tab ends (Figs. 5b and 10 as applied to claim 9).

JP '665 discloses a lithium ion battery comprised of: a plurality of generally planar cell sections (Fig. 4), each cell section having at least one flat metallic current collector tab (5a, and 5b) extending therefrom, said cell sections being stacked one on another to form a cell body, a plurality of said cathode current collector tabs 5a being aligned and extending from one side of the cell body, each of the current collector tabs 5a having an intermediate end and a free end (Figs. 2-4) a plurality of said anode current collector tabs 5b being aligned and extending from one side of the cell body, a cathode tab weldment (interface between tab ends 5a and leads 11) joining the free ends of the cathode current collector tabs but leaving the intermediate ends of the current collector tabs

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unattached to each other (Fig. 10), said cathode current collector tabs are welded together at a location offset from the cell body, such that the cathode current collector tabs are folded into a generally U-shaped configuration (Fig. 5b) with said unattached intermediate portions forming a smooth layered generally U shaped structure with said cathode tab ends disposed adjacent said one side of the cell body, an anode tab weldment (interface between anode tab ends and leads 11) joining the free ends of the anode current collector tabs 5b but leaving the intermediate ends of the current collector tabs unattached to each other (Fig. 10), said anode current collector tabs 5b are welded together at a location offset from the cell body, such that the anode current collector tabs are folded into a generally U-shaped configuration with said unattached intermediate portions forming a smooth layered generally U shaped structure with said anode tab ends disposed adjacent said one side of the cell body (Fig. 5B as applied to claim 14).

14. Claims 8, 9 and 14 are rejected under 35 U.S.C. 102(a) as being anticipated by EP 1045466 A1 (EP '466).

EP '466 discloses a lithium ion battery comprised of: a plurality of generally planar cell sections (Fig. 2), each cell section having at least one flat metallic current collector tab (101a and 102a) extending therefrom, said cell sections being stacked one on another to form a cell body having a planar upper surface and a planar lower surface; a plurality of said current collector tabs 101a and 102a being aligned in spaced apart relationship between said upper planar surface and said lower planar surface (Fig. 2) and extending from one side of the cell body, each of said tabs having a free end and an intermediate portion, the

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free ends of the tabs are connected but the intermediate portions of the tabs are unattached to each other when said tabs are stacked together at a location offset from the cell body (Fig. 2), such that the tabs are folded into a generally U-shaped configuration with said unattached intermediate portions forming a smooth layered generally U shaped structure with said tab ends disposed adjacent said one side of the cell body (Fig. 2 as applied to claim 8).

Leads 101 and 102 are attached to the tab ends 101a and 102a (Fig. 2 as applied to claim 9).

EP '466 discloses a lithium ion battery comprised of: a plurality of generally planar cell sections (Fig. 2), each cell section having at least one flat metallic current collector tab (101a and 102a) extending therefrom, said cell sections being stacked one on another to form a cell body, a plurality of said cathode current collector tabs 102a being aligned and extending from one side of the cell body, each of the current collector tabs 102a having an intermediate end and a free end (Figs. 2-4) a plurality of said anode current collector tabs 101a being aligned and extending from one side of the cell body, a cathode tab weldment (interface between cathode tab ends and lead) joining the free ends of the cathode current collector tabs but leaving the intermediate ends of the current collector tabs unattached to each other (Figs. 1 and 2), said cathode current collector tabs are welded together at a location offset from the cell body, such that the cathode current collector tabs are folded into a generally U-shaped configuration with said unattached intermediate portions forming a smooth layered generally U shaped structure with said cathode tab ends disposed

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adjacent said one side of the cell body, an anode tab weldment (interface between anode tab ends and leads) joining the free ends of the anode current collector tabs but leaving the intermediate ends of the current collector tabs unattached to each other (Figs. 1 and 2), said anode current collector tabs are welded together at a location offset from the cell body, such that the anode current collector tabs are folded into a generally U-shaped configuration with said unattached intermediate portions forming a smooth layered generally U shaped structure with said anode tab ends disposed adjacent said one side of the cell body (Figs. 1 and 2 and paragraphs [0004]-[0005] and [0017]-[0019] as applied to claim 14)

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 10 are 15-17 and are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '665 in view of either the admitted prior art relied upon in the instant application.

The teachings of claims 8-9 and 14, with respect to JP '665, have been discussed above and are incorporated herein.

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The differences between instant claims 9-11 and 15-16 and JP '665 are that JP '665 does not appear to teach of the leads 11 comprising a strip of metal (claims 10, 15 and 16) or of the tabs formed of a metal mesh selected from the group consisting of copper, aluminum and nickel and the metal strips are from the group consisting of copper, aluminum and nickel (claim 17),

With respect to the leads comprising a strip of metal (claims 10, 15 and 16):

The background art of the instant application teaches that it is known in the art to use metal strips as the lead materials (page 1, paragraph [0004]).

The skilled artisan would have recognized the motivation for using a metal material such as copper or aluminum to provides a lead having superior electrical conductivity.

With the current collectors being a metallic material such as aluminum or copper (paragraph [0010]) one of ordinary skill in the art would have found it desirable to employ the same metal material to be the leads because it would have provided the same degree of electrical conductivity from the cell to an external source which the cell is used in.

The motivation for using leads comprising a strip of metal is that it provides a high electrical conductive path from the cell .

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '665 by using a metal material as the lead since it would have provided a lead having superior electrical conductivity. The selection of a known material based on its

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suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

With respect to claim 17:

The background art of the instant application teaches that it is known in the art to use metal screens or meshes of copper and aluminum for electrode current collectors. Furthermore the lead material is typically a flat metallic strip formed of copper, nickel or aluminum (page 1, paragraph [0004]).

The skilled artisan would have recognized the motivation for using a metal material such as copper or aluminum as the material for the current collectors and leads since these materials are known in the art as having superior electrical conductivity. With the current collectors being a metallic material such as aluminum or copper (paragraph [0010]) one of ordinary skill in the art would have found it desirable to employ the same metal material to be the leads because it would have provided the same degree of electrical conductivity from the cell to an external source which the cell is used in.

The motivation for using metal materials such as aluminum, copper and nickel for the tabs and leads is that it provides a high electrical conductive path from the cell .

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '665 by

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using metal materials such as aluminum, copper and nickel for the tabs and leads since it would have provided an high electrical conductive path from the electrodes through the leads. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

17. Claims 11-13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '665 in view of the admitted prior art relied upon in the instant application as applied to claim 10 above, and further in view of JP 2000-215877-A (JP '877).

With respect to claims 11 and 12:

The differences not yet discussed are of a portion of the metallic strip being disposed between the tab weldment and one side of the cell body (claim 11) or of metallic strip wrapped around the tab weldment (claim 12).

JP '665 discloses that folding the tabs and leads in a U-shape as shown in Fig. 5b provides an electrochemical cell configuration having large electric capacitance per volume by reducing the binding space of the tab (abstract).

Fig. 3 of JP '877 show a tab/lead weldment wherein the leads are wrapped around the tabs of the electrodes.

The motivation for configuring the metallic strip wrapped around the tab weldment is that it prevents disconnecting of the lead terminals (abstract).

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Securing the leads in the manner taught by JP '877 to the tab configuration of JP '665 would have resulted in a configuration wherein the leads would be wrapped on the side of the tab facing the cell and thus between a side of the cell and the tab (as applied to claims 11 and 12).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '665 by wrapping the leads around the bent tabs of JP '665 as taught by JP '877 since it would have prevented disconnecting of the leads from the tabs.

With respect to claim 13:

JP '665 shows the leads having a width approximately equal to the width of the tabs (Fig. 10)

The difference not yet discussed is of the collector tabs comprised of metallic mesh and the lead being a solid metal (claim 13).

The background art of the instant application teaches that it is known in the art to use metal screens or meshes of copper and aluminum for electrode current collectors. Furthermore the lead material is typically a flat metallic strip formed of copper, nickel or aluminum (page 1, paragraph [0004]).

The skilled artisan would have recognized the motivation for using a metal material such as copper or aluminum as the material for the current collectors and leads since these materials are known in the art as having superior electrical conductivity. With the current collectors being a metallic material such as aluminum or copper (paragraph [0010]) one of ordinary skill in the art would have

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found it desirable to employ the same metal material to be the leads because it would have provided the same degree of electrical conductivity from the cell to an external source which the cell is used in.

The motivation for using metal materials such as aluminum, copper and nickel for the tabs and leads is that it provides a high electrical conductive path from the cell .

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '665 by using metal materials such as aluminum, copper and nickel for the tabs and leads since it would have provided an high electrical conductive path from the electrodes through the leads. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

With respect to claim 18:

The difference not yet discussed is of the metal strips wrapped on respective tabs wherein a portion of each respective metal strip is disposed between respective tabs and one side of the cell (claim 18).

JP '665 discloses that folding the tabs and leads in a U-shape as shown in Fig. 5b provides an electrochemical cell configuration having large electric capacitance per volume by reducing the binding space of the tab (abstract).

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Fig. 3 of JP '877 show a tab/lead weldment wherein the leads are wrapped around the tabs of the electrodes.

The motivation for configuring the metallic strip wrapped around the tab weldment is that it prevents disconnecting of the lead terminals (abstract).

Securing the leads in the manner taught by JP '877 to the tab configuration of JP '665 would have resulted in a configuration wherein the leads would be wrapped on the side of the tab facing the cell and thus between a side of the cell and the tab (as applied to claims 11 and 12).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '665 by wrapping the leads around the bent tabs of JP '665 as taught by JP '877 since it would have prevented disconnecting of the leads from the tabs. The resultant combined teachings would have resulted in a configuration wherein the leads would be wrapped on the side of the tab facing the cell and thus between a side of the cell and the tab.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (703) 305-0635. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (703) 308-2383. FAX communications should be sent to the

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appropriate FAX number: (703) 872-9311 for After Final Responses only; (703) 872-9310 for all other responses. FAXES received after 4 p.m. will not be processed until the following business day. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gregg Cantelmo
Patent Examiner
Art Unit 1745

gc


April 6, 2003